Chapter 2

THE NATURE OF THE VALUE-ADDED TAX

I. Introduction

A value-added tax is a multistage sales tax that is collected at each stage or point in the production and distribution process. In a typical business operation, a firm purchases raw materials from its suppliers and produces a product or service by processing, manufacturing, distributing, or otherwise "adding value" to its initial purchases of goods and materials from other firms. While value added may be calculated in various ways, it is easiest to think of it simply as the difference between a firm's sales and its (non-labor) purchases of produced goods. If a firm buys $60 worth of raw materials from other firms and produces a product that sells for $100, its value added is said to be $40. With a tax rate of 10 percent, its value-added tax liability would be $4. Normally, of course, many different firms and activities are involved in producing a product and distributing it to the consumer. Consider the case of a loaf of bread. The farmer, miller, baker, trucker, and grocer are all involved in growing the ingredients, producing the bread, and delivering it to the consumer. In this example, a value-added tax would apply to the value added by each firm that is involved in the production and distribution of the bread.

Since many firms are usually involved in producing a good for the market, it is convenient to think of the retail price or value of a product (or service) as being equal to the total of the values added in the production and distribution process. The loaf of bread, in other words, will sell for the total of the value added by the farmer, miller, baker, trucker, grocer, and anyone else involved in getting it to the consumer. Thus, a value-added tax that extends through the retail level would collect essentially the same amount of tax on a product as would a retail sales tax levied at the same rate of tax. A value-added tax, however, differs from a retail sales tax in that the tax is collected piecemeal, in several stages, rather than exclusively on the retail sale.

II. Alternative Forms of Tax

There are three separate types of value-added tax: gross product, income, and consumption. They differ in their treatment of capital equipment that has been purchased from other firms. This difference may be illustrated by assuming that a firm calculates its value added by subtracting its purchases from other firms from its sales and then applying the tax rate to the resulting value added to determine its tax liability, even though this is not the method normally used to calculate tax liability under a value-added tax. For the sake of

simplicity and clarity of explanation, this illustration will also not consider the question of whether exports or government purchases would be subject to the tax.

A. Gross Product Type

In determining its tax liability under a gross product value-added tax, a firm would be allowed to deduct its purchases of raw materials from its sales, but it would not be allowed to deduct the cost of its purchases of capital equipment, or even the depreciation on that capital equipment. Since gross investment purchases (including depreciation) are subject to taxation, the economic base of a gross product value-added tax is similar to gross national product. Capital investment is, in effect, taxed twice under the gross product tax. Capital goods are taxed at the time they are purchased and also when the products they produce are sold to consumers. In contrast, raw materials and other non-capital items that are purchased from other firms (that is, purchases on current account) may be deducted from sales under a gross product tax. Output generated by these purchases is, of course, taxed at the time of sale.

A gross produce type of value-added tax would create significant administrative difficulties in those borderline cases where it is difficult to distinguish expenditures for capital goods from those for items that are exhausted currently in production or for repair and maintenance purposes. Since capital purchases are not deductible in determining tax liability, there would be an incentive to classify them as current expenditures. The difficulties would be more pronounced than under the income tax where capital expenditures are eligible for a depreciation allowance and perhaps an investment tax credit. There also would be an incentive for self-construction of capital goods.

Of the three different types of value-added tax, the gross product version places the heaviest tax burden on capital goods. It would discourage saving, discriminate against capital intensive methods of production, and cause firms to delay modernization and upgrading of plant and equipment by minimizing expenditures on capital assets. The gross product tax is best relegated to the realm of conceptual curiosities and should not receive serious consideration in public policy discussions.

B. Income Type

Under the income variant of the value-added tax, both purchases of raw materials and depreciation on capital goods would be deducted from sales in computing a firm's value added. Since net investment purchases (gross investment less depreciation) are subject to taxation, the economic base of this tax is similar to net national income. By taxing net investment, this tax would impose a tax burden on net purchases of capital goods. Because this type of value-added tax requires the calculation of depreciation allowances, it would have some of the same administrative problems that arise under an income

tax. Asset lives and depreciation paths would have to be specified. A given depreciation stream may not be correct if the rate of inflation changes markedly. There would be an incentive to classify purchases as current expenditures, which are deductible, rather than capital expenditures, which must be depreciated. This is not to criticize the income tax, but to point out that many of the same difficulties would arise under either an income tax or an income type value-added tax. As long as the United States has an income tax there is no reason to adopt an income-type value-added tax.

C. Consumption Type

Under the consumption-type value-added tax, all business purchases, including those for capital assets, would be deductible in calculating a firm's value added. Since a full deduction is allowed for gross investment, this alternative would result in a tax base equivalent to total private consumption. A consumption value-added tax avoids the need to distinguish between capital and current expenditures or to specify asset lives and depreciation allowances for capital assets. As noted above, both the gross product and income versions of the value-added tax would penalize capital investment by placing an additional tax burden on capital equipment purchases; the tax would be imposed on the capital good itself and on the output produced by the capital good. In contrast, a consumption-type value-added tax would be neutral between methods of production since substituting capital for labor (or vice versa) would not affect a firm's total taxes; it also would be neutral between the decision to save or consume. Because of these characteristics, the consumption version is the type of value-added tax used in Europe and the only type that should receive consideration in the United States.

III. Alternative Methods of Calculation: Subtraction, Credit, Addition

Though value added is often thought of as the difference between a firm's sales and its purchases, value-added tax liability may be calculated by three different methods: by subtraction, credit, or addition. These three alternatives are illustrated by the example in Table 2-1. That example assumes an economy with only three firms (one each in manufacturing, wholesaling, and retailing) and in which the manufacturing sector sells all of its output to the wholesale sector; the wholesale sector buys only from the manufacturing sector and sells all of its output to the retail sector. The rate of tax is 10 percent.

A. Subtraction Method

Under this method, illustrated in the top part of Table 2-1, a firm calculates its value-added tax liability by subtracting its purchases from other firms from its sales and applying the tax rate to the difference. With a consumption value-added tax, the deduction for purchases would include any capital equipment bought during the period. In contrast, only depreciation on capital equipment would be deductible under the income version of value-added tax. In either

instance, purchases of raw materials and other intermediate goods would be deductible in determining a firm's value added.

B. Credit Method

The credit, or invoice, method is used by all of the member countries in the European Economic Community (EEC) and by most other countries that have a value-added tax. Under the credit method, a firm's tax liability is determined by allowing the firm to subtract value-added tax paid on purchases from tax due on its sales. This method is illustrated in the middle panel of Table 2-1. The amount of deductible tax paid on purchases would include the full amount of tax paid on any capital equipment purchases in the case of a consumption-type value-added tax. Alternatively, for the income version of value-added tax, the tax paid on capital equipment would be amortized or depreciated over the life of the asset, rather than being deducted entirely in the year when the capital asset was purchased.

An important characteristic of the credit method is that except in the case of outright exemption of intermediate stages of production the tax on a product depends on the tax rate that prevails at the final taxable stage; this would be the rate levied at the retail stage in the case of a value-added tax that extends through the retail level. Thus, any value-added tax evaded by firms prior to the retail level would result in higher taxes at the retail level; lower tax rates at pre-retail stages would be offset by full collection of the tax at the retail level. This can be seen from a slight modification of the Table 2-1 illustration of the credit method. If no tax is paid by either the manufacturer or wholesaler, the total tax on the $1,100 in (pre-tax) retail sales would still be $110, the same as when the tax is distributed among the three sectors. (The example in Table 2-1 does not explicitly show the $10 in tax on the $100 in purchases made by Firm A, the manufacturer.) In this instance, the full tax liability would be collected at the retail level, the same as under a retail sales tax, since the retailer would have no credit for tax paid on purchases.

C. Addition Method

Though value added is equal to the difference between a firm's sales and its purchases, it also is equal to the payments for the labor and capital that generate the value added. Under the addition method, a firm's value-added tax liability is calculated by adding together the components of value added, wages, rent, interest, and net profit, and then applying the tax rate to that sum. It is illustrated in the lower panel of Table 2-1. Since net profit normally reflects a capital depreciation allowance, the addition method is usually associated with an income type of value-added tax. A consumption method value-added tax could be implemented by the addition method only if net profit was based on the expensing or full immediate deductibility of capital equipment purchases. If the objective is a consumption value-added tax, this can be achieved more easily under the credit method than by calculating net profit (with capital expensing) and

Table 2-1

Comparison of Three Methods of Calculating
Value-Added Tax Liability
(10 percent value-added tax)

	STAGE OF PRODUCTION			
	Firm A : Manufacturer	Firm B : Wholesaler	Firm C : Retailer	Total Economy
1. SUBTRACTION METHOD:				
Sales	$350	$850	$1,100	$2,300
Purchases	100	350	850	1,300
Value added (sales minus purchases)	250	500	250	1,000
Value-added tax	25	50	25	100
2. CREDIT METHOD:				
Sales	350	850	1,100	2,300
Tax on sales	35	85	110	230
Purchases	100	350	850	1,300
Tax on purchases	10	35	85	130
Value-added tax (tax on sales less tax on purchases)	25	50	25	100
3. ADDITION METHOD:				
Factor payments plus net profit				
Wages	150	300	200	650
Rent	50	100	20	170
Interest	25	75	20	120
Profit	25	25	10	60
Total	250	500	250	1,000
Value-added tax	25	50	25	100

adding it to the other factor payments. The calculation of net profit involves all of the problems that plague the current income tax.

D. Analysis and Summary

The subtraction, credit, and addition methods should be viewed as equivalent only in the case of a single rate of tax applying to nearly all goods and services. In such a situation, the three methods would work equally well and would generate the same amount of total tax revenue. A more realistic situation is one in which policymakers may prefer a single-rate value-added tax for administrative and efficiency reasons, but in which it will be necessary to tax some goods and services at special rates. In a world in which all goods and services are not taxed at the same rate, the credit method is superior to either the subtraction or addition alternatives.

Under the subtraction approach, virtually every sector of the economy would exert political pressure for special treatment. This is because ultimate tax liability on a given product would depend on two factors: value added in each sector or industry and the tax rate applied to that value added. Assuming that firms do not incorrectly overstate purchases or understate sales, they would have relatively little control over their value added subject to tax. But they would try to minimize their value-added tax liability by seeking preferential, or perhaps even zero, rates of value-added tax on their own sector or industry.

With the credit method, in contrast, since tax liability on final consumption depends on the tax rate imposed at the final or retail stage, the mining, agricultural, manufacturing, and other non-retail sectors would have less incentive to seek special treatment and be less likely to do so. Because any tax charged on their sales may be credited by their (non-retail) customers, it should (recordkeeping considerations aside) be a matter of indifference to firms making non-retail sales as to whether or not they are subject to the tax. Indeed, as shown below, exemption from tax would actually be adverse to the exempt firm's non-retail customers.

Special rates, which would be more likely under the subtraction or addition method than under the credit alternative, would have a number of adverse economic consequences. They would unfairly favor those consumers with strong preferences for lightly-taxed goods and penalize those preferring to buy more heavily-taxed items. To the extent that the nonuniform rates induced changes in buying habits, consumer satisfaction would decline and the government would collect less revenue. As explained in section IV, a so-called indirect tax, such as a value-added tax, may be rebated on exports under international trading rules. With differential rates for various sectors or products, it would be virtually impossible under the subtraction method to calculate the correct amount of tax that would be permitted as a rebate on exports and collected on imports. Differential rates would make the tax more complex, both for taxpayers and tax administrators, thus increasing compliance and administration costs.

Though multiple rates are far less satisfactory than a single rate of value-added tax, the experience of other countries demonstrates that it may not be possible to avoid them. The credit method is attractive not only because it makes the tax base less vulnerable to erosion from pleas of special interest groups for tax relief, but because it is superior to the subtraction method in accommodating the demands that will be made for tax relief for some goods or services. Under the credit method, goods and services can be freed of tax by simply applying a rate of "zero" at the retail stage and allowing a full credit for pre-retail taxes. In similar fashion, the accurate rebate of tax on exports occurs automatically. The same result could only be achieved under the subtraction method by applying a rate of zero at each and every stage of production or distribution through which the tax favored good or service passes.

Both the subtraction and credit methods contain incentive features that may assist the Internal Revenue Service (IRS) in the administration and enforcement of both the value-added tax and the income tax. Under the subtraction method, Firm A in Table 2-1 may have an incentive to understate its sales, for either value-added or income tax purposes. But its business customer, Firm B, has an offsetting incentive to have its purchases from A properly specified on the sales invoice so that Firm B gets a full deduction for those purchases. A similar "cross checking" situation exists under the credit method. Since Firm B may credit taxes it is charged by Firm A, it will wish to insure that Firm A's invoice properly identifies the tax on those sales. Thus, either the credit or subtraction method provides tax administrators with a record of sales and purchase information which may be useful for enforcement purposes. Analysis of the records of Firm B can be used in auditing the supplier (Firm A), or, the records of Firm A can be used to assist in an audit of Firm B (the customer).

The addition approach would have some of the same problems as the subtraction method in avoiding pleas for differential rates and in determining accurate border tax adjustments if the tax were not imposed at a uniform rate on all goods and services. It would probably not provide tax administrators with any more enforcement information than they now receive under the income tax.

IV. Border Tax Adjustments

In 1983, U.S. exports of goods and services were equal to about 10 percent of the economy's output. In the United States, as in other countries, the design of a value-added tax must take into account the fact that the movement of goods and services across national borders is commonplace.

Taxes on commodities entering international trade can be levied on either of two principles. A product can be taxed in either the country where it is produced or where it is consumed. If a product is taxed where it is produced, it is said to be taxed on the basis of its origin or place of production. Alternatively, if a product is taxed where it is consumed, it is taxed on the basis of its destination or

location of consumption. In principle, a value-added tax can be imposed on either of these bases, origin (production) or destination (consumption), but virtually all countries using the value-added tax rely on the destination principle so that imports and domestically-produced goods compete on an equal tax footing.

Suppose, referring again to Table 2-1, that the manufacturing activity took place in one country and the wholesaling and retailing activities in another country. A value-added tax could be implemented on an origin basis merely by allowing each country to tax (at whatever rate it chooses) value-added generated within its borders. The country of manufacture would tax $250 in value added, while the country in which the wholesaling and retailing activities occurred would tax the remaining $750 in value added. The origin principle could be implemented naturally by the subtraction method, since it provides a direct measure of value added. An important consequence of the origin principle is that a good traded internationally may bear a different amount of value-added tax than that of a competitive good produced exclusively in a single country. Only in the unusual case in which the exporting and importing countries have the same rate of value-added tax would the taxes on the traded and domestically-produced goods be the same.

As an alternative to the origin principle, a value-added tax may be implemented on a destination basis. In this case, value-added tax is imposed only where the good is consumed, not where it is produced. This necessitates a rebate of any tax imposed in the exporting country and a compensatory tax in the importing country to equalize the tax burden with a good that is domestically produced and consumed. The export rebate and import tax, designed to place traded and domestically-produced goods on an equal tax footing in the country where they are consumed, are known as border tax adjustments. State retail sales taxes are levied under the destination principle. A state retail sales tax is not imposed on goods destined for export out of the taxing state, but is levied on any imports sold to consumers in the taxing state.

The credit method of determining value-added tax liability is superior to either the addition or subtraction approaches for implementing the destination principle. The rebate of tax on exports is accomplished by simply applying a tax rate of zero at the export stage and giving the exporter full credit for any tax paid on inputs purchased to produce the export good. This procedure frees the export from all value-added tax imposed in the exporting country. Consider again the example in Table 2-1 in which manufacturing occurs in the exporting country and wholesaling and retailing in the importing country. The exporting country implements the destination principle by applying a rate of zero, rather than 10 percent, to the $350 in export sales and allowing a full credit or refund for the $10 in tax paid on purchases related to the export sales. In this way, those exports enter the importing country free of any value-added tax from the exporting country.

Unless the import good is purchased directly by the final consumer, rather than from a taxable firm, it is not even necessary for the importing country to explicitly levy the value-added tax at the import stage to implement the destination principle. Under the credit method, the tax on a product depends on the rate applied on the final sale to the consumer. As long as the retailer, in the Table 2-1 example, charges a tax rate of 10 percent on its $1,100 in sales, the full value-added tax of $110 will be collected. Even if the wholesaler was the importer, it would not be necessary for a tax to be levied on the wholesaler's import purchases. If value-added tax was imposed, the retailer would be allowed a credit, but if no tax is charged, there would be no credit. In either case, provided there is at least one taxable firm between the import stage and final consumer, the credit method will insure that consumption of imports and domestically-produced goods takes place on an equal tax footing, as required by the destination principle.

In contrast to a credit method value-added tax, there are substantial complexities to implementing the destination principle under either the subtraction or addition methods. Under the credit method, prior-stage tax is revealed directly by the amount of credit available with respect to a firm's purchases. Thus, the border tax adjustment on exports can be determined precisely. But, under the addition and subtraction methods, if the value-added tax rate at each of these pre-export stages is not the same, it would be very difficult for the exporting country to know the correct amount of value-added tax to allow as an export rebate. To determine the current amount of border tax adjustment it would be necessary to know the number of previous stages, the value added at each of those stages, and the tax applied at each of those stages.

On the import side of the ledger, any tax not imposed at the import stage under the addition method would be lost completely. Under the subtraction method, the destination principle would be implemented by denying a firm a deduction for purchases of inputs on which no tax had been paid. This should probably occur at the import stage. Still, it will be difficult to treat imports and domestically-produced goods the same if different rates of tax have been applied at pre-retail stages to the domestic goods. In contrast to the credit method, both the addition and subtraction alternatives would place pressure on tax administrators to ensure that value-added tax was collected at the import, as well as at all subsequent taxable stages.

V. Value-Added Tax versus Retail Sales Tax

A consumption-type value-added tax that extends through the retail stage is similar to a retail sales tax in that the two taxes will collect the same amount of revenue, assuming they are imposed at the same rate of tax and have equal coverage. This is illustrated in Table 2-2 which compares a consumption-type value-added tax with a retail sales tax, each levied at 10 percent. Value-added tax liability is calculated under the credit method. In each case, the product sells at

retail for $1,000, before tax. Under the retail sales tax, illustrated on the right-hand side of Table 2-2, the retailer charges the customer a tax of $100 and sells the product for $1,100, including tax. Neither the manufacturer nor wholesaler charge retail sales tax since neither makes retail sales. This same total amount of tax of $100 is collected under the value-added tax, but it is collected piecemeal from the manufacturer ($25), wholesaler ($50), and retailer ($25), rather than being collected entirely at the retail level. Thus, a value-added tax can be viewed as a multistage tax equivalent to a retail sales tax. With equal coverage and tax rates, the two taxes will raise equivalent amounts of revenue.

Administrative differences between the two taxes create some important economic differences. They are mentioned here and discussed more fully in Chapter 4. The number of firms involved may be smaller under a retail sales tax, but the difference may not be as significant as first appears since nonretail firms may make some (taxable) retail sales. It also is necessary for tax administrators to check that tax-exempt purchases by nonretail firms have been made for legitimate tax-free purposes. A value-added tax may be more successful than a retail sales tax in freeing capital equipment and other business purchases from tax. Reportedly, this was the reason that Sweden replaced its retail sales tax with a value-added tax in 1969. If capital equipment and business purchases are taxed, the multiple taxation that arises discriminates against those goods produced with business equipment that has been taxed and makes it difficult to calculate the proper border tax adjustments on exports sales. Imports would receive preferential treatment compared to domestically-produced goods since the border tax adjustment would apply to the import itself, but not to the capital equipment used to produce the import.

A value-added tax will be more successful than a retail sales tax in collecting some revenue on those transactions escaping taxation through the "underground economy," which consists of informal economic activity not reported for tax purposes and illegal activities associated with narcotics, gambling, and prostitution. Because value-added tax is collected at each of the links in the production and distribution process, some tax will be collected even if no tax is charged on the actual retail sale. Even if an enterprise does not pay tax on its retail sales, it would, the argument goes, at least pay tax on its purchases. This assumes, however, that the firm is not able to successfully claim a credit or refund for tax paid on those purchases related to the sales on which it does not charge tax.

To the extent that it substitutes for an income tax, a value-added tax might even be successful in reducing the "tax gap," which IRS estimated to be about $90 billion annually in 1981 (before being reduced by subsequent tax rate reductions and changes in enforcement procedures). The tax gap relates to income taxes, not to sales or value-added taxes, and is defined as the difference between the total amount of income tax (corporate and individual) voluntarily paid for a given year and the correct tax liability for that year. According to recent IRS estimates, the underground economy, accounts for only 15

Table 2-2

Comparison of Value-Added and Retail Sales Tax

PRODUCT STAGE	VALUE-ADDED TAX (10 Percent)			RETAIL SALES TAX (10 Percent)		
	Before Tax	Tax	After Tax	Before Tax	Tax	After Tax
MANUFACTURE:						
Sales	$250	$25	$275	$250	$ 0	$250
Purchases	-	0			0	0
Net Tax		25			0	
WHOLESALE:						
Sales	750	75	825	750	0	750
Purchases	250	25	275	250	0	250
Net Tax		50			0	
RETAIL:						
Sales	1000	100	1100	1000	100	1100
Purchases	750	75	825	750	0	750
Net Tax		25			100	
TOTAL TAX		$100			$100	

percent of the total income tax gap. The remainder of the tax gap reflects many forms of noncompliance unrelated to the underground economy, such as: the failure to properly report income from unincorporated businesses, dividends, interest, and capital gains; overstating deductions and business expense; failure to file income tax returns; and failure to pay acknowledged liabilities. To the extent that any of this unreported income stemming from noncompliance is used to purchase taxable goods and services, a value-added tax would reach this portion of the tax gap, regardless of whether the income was from unreported activities or from the illegal sector.

Forty-five states have a retail sales tax, but none has a consumption-type value-added tax. (Michigan has an additive-type, income-based value-added tax which replaced its state corporate income tax, but has corporate profits in its base.) If the Federal government were to adopt a national sales tax, it might be possible to piggyback the state sales taxes with a national retail sales tax. This kind of Federal-state coordination would be more difficult to achieve with a value-added tax. This factor, however, should not be overemphasized. While there are statutory provisions for piggybacking state and Federal income taxes, no state has chosen to do so.

VI. Summary

A value-added tax may be imposed on different tax bases, and tax liability may be calculated in various ways. Not all forms would be suitable for the United States. If the policy debate in the United States ever focuses on choosing a form of value-added tax, it should concentrate on a value-added tax with the following characteristics:

1. consumption type;
2. credit method of determining tax liability; and
3. destination principle of border tax adjustments.

As explained in Chapter 3, the tax should also have a broad base, with only minimal and well justified exclusions, and it should be imposed at a single, uniform rate.